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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,417	03/01/2002	Chihaya Adachi	10020/21302	3481
26646	7590	10/08/2003	EXAMINER	
KENYON & KENYON ONE BROADWAY NEW YORK, NY 10004			KEANEY, ELIZABETH MARIE	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/087,417	ADACHI ET AL.	
	Examiner	Art Unit	
	Elizabeth Gemmell	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-44 is/are rejected.
- 7) ☒ Claim(s) 3, 11, 21 and 34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input checked="" type="checkbox"/> Other: <i>See Continuation Sheet</i> . |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the anode, hole-transporting layers, electron transporting layers and cathode must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Information Disclosure Statement

2. The information disclosure statement filed 24 June 2002 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Copies of the US Patent applications are not in the file. However, due to the change in the PTO's filing system, it is unclear whether these were indeed filed but not scanned into the file, or if they were not filed. Therefore, the examiner requests copies of these references to be placed in the file.

Claim Objections

Claims 3,11,21 and 34 are objected to because of the following informalities:

- “4,4’,4”-tris(30methylphenylphenylamino)triphenylamin (MTADATA);
should be -- 4,4’,4”-tris(3-methylphenylphenylamino)triphenylamin
(MTADATA)

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,3,7 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Baldo et al. (US Patent 6,097,147; hereinafter Baldo).

The applied reference has common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a

showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Re claim 1: Baldo discloses, in figure 3 and throughout the disclosure, an organic light emitting device comprising:

- an anode (511);
- a hole transporting layer over the anode (512), wherein the hole transporting layer is doped with a phosphorescent material (column 6, line 10; NPD);
- an electron transporting layer over the hole transporting layer (515), wherein the electron transporting layer is doped with the phosphorescent material (column 6, line 14; Alq₃); and
- a cathode over the electron transporting layer (517).

Re claim 3: Baldo discloses the hole transporting layer comprising NPD (column 6, line 10).

Re claim 7: Baldo discloses the cathode comprising magnesium silver alloy (column 6, lines 15-16) and the anode comprising ITO (column 6, line 9).

Re claim 8: Baldo discloses the electronic device selected from the group consisting of a billboard, a sign, a computer monitor, a vehicle, a telecommunications device, a telephone, a printer, a television, a large area wall screen, a theater screen and a stadium screen (column 5, lines 54-67).

Claims 1-7,9-11,14-21,24-34 and 37-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Aziz et al. (US Patent 6,614,175; hereinafter Aziz).

Re claim 1: Aziz discloses, in figure 1 and throughout the disclosure, an organic light emitting device comprising:

- an anode (12);
- a hole transporting layer over the anode (15), wherein the hole transporting layer is doped with a phosphorescent material;
- an electron transporting layer over the hole transporting layer (15), wherein the electron transporting layer is doped with the phosphorescent material; and
- a cathode over the electron transporting layer (18).

Re claim 2: Aziz discloses the organic light emitting device that emits light in the blue region (column 13, line 59).

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Re claim 3: Aziz discloses the hole transporting layer comprises a member of the group consisting α -NPD, TPD, M14, MTDATA, HMTPD and R854 (column 15, line 23- column 16, line 3).

Re claim 4: Aziz discloses the electron transporting layer comprises a member of the group consisting of an oxadiazole, an oxadiazole derivative, a phenanthroline, a substituted benzoxazole, an un-substituted benzoxazole, a substituted benzthiazole, and an un-substituted benzthiazole compound (column 17, line 35- column 18 line 25).

Re claim 5: Aziz discloses the electron transporting layer comprising a member of the group consisting of OXD-7, BCP, a BCP derivative and TAZ (column 17, line 35- column 18, line 25).

Re claim 6: Aziz discloses the phosphorescent material comprising a member of the group consisting of Pt(ppy)(acac), Pt(tpy)(acac), Pt(bzq)(acac), Pt(btp)(acac), Pt(4,6-F2ppy)(acac), Pt(4,5-F2ppy)(acac), Pt(4,5-F2ppy)(pico), and Ir(4,6-F2ppy)(pico) (column 18, line 32-column 19, line 3).

Re claim 7: Aziz discloses the cathode comprising a member of the group consisting of magnesium silver and a magnesium silver alloy (column 21 lines 10-37), and the anode comprises ITO (column 14, line 51).

Re claim 9: Aziz discloses, in figure 1 and throughout the disclosure, an organic light emitting device comprising:

- an anode (12);
- a first hole transporting layer over the anode (13)
- a second hole transporting layer over the first hole transporting layer (15), wherein the second hole transporting layer is doped with a phosphorescent material;
- a first electron transporting layer over the hole transporting layer (15), wherein the first electron transporting layer is doped with the phosphorescent material;
- a second electron transporting layer over the first electron transporting layer (16); and
- a cathode over the electron transporting layer (18).

Re claim 10: Aziz discloses the organic light emitting device that emits light in the blue region (column 13, line 59).

Re claim 11: Aziz discloses the first and second hole transporting layer comprising a member of the group consisting α -NPD, TPD, M14, MTDATA, HMTDPD and R854 (column 15, line 23- column 16, line 3).

Re claim 14: Aziz discloses the first electron transporting layer comprising a member of the group consisting of an oxadiazole, an oxadiazole derivative, a

phenanthroline, a substituted benzoxazole, an un-substituted benzoxazole, a substituted benzthiazole, and an un-substituted benzthiazole compound (column 17, line 35- column 18 line 25), where wherein the second electron transporting layer comprises a member of the group consisting of Alq3 and a phthalocyanine compound (column 17, line 26).

Re claim 15: Aziz discloses the first electron transporting layer comprising a member of the group consisting of OXD-7, BCP, a BCP derivative and TAZ, wherein the second electron transporting layer comprises CuPc (column 17, line 35- column 18, line 25).

Re claim 16: Aziz discloses the phosphorescent material comprising a member of the group consisting of Pt(ppy)(acac), Pt(tpy)(acac), Pt(bzq)(acac), Pt(btp)(acac), Pt(4,6-F2ppy)(acac), Pt(4,5-F2ppy)(acac), Pt(4,5-F2ppy)(pico), and Ir(4,6-F2ppy)(pico) (column 18, line 32-column 19, line 3).

Re claim 17: Aziz discloses the cathode comprising a member of the group consisting of magnesium silver and a magnesium silver alloy (column 21 lines 10-37), and the anode comprises ITO (column 14, line 51).

Re claim 18: The Examiner notes that the claim limitation of "the electronic device selected from the group consisting of... stadium screen" is drawn to the intended

use of the claimed invention. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. It is well established that the claimed apparatus cannot be distinguished over the prior art by an intended use limitation. Consequently, absent of showing an unobvious difference between the claimed product and the prior art, the intended use claim limitation is not afforded patentable weight.

Re claim 19: Aziz discloses, in figure 1 and throughout the disclosure, an organic light emitting device comprising:

- a substrate (11);
- an anode (12);
- a first hole transporting layer over the anode (13)
- a second hole transporting layer over the first hole transporting layer (15), wherein the second hole transporting layer is doped with a phosphorescent material;
- a first electron transporting layer over the hole transporting layer (15), wherein the first electron transporting layer is doped with the phosphorescent material;
- a second electron transporting layer over the first electron transporting layer (16); and
- a cathode over the electron transporting layer (18).

Re claim 20: Aziz discloses the organic light emitting device that emits light in the blue region (column 13, line 59).

Re claim 21: Aziz discloses the first and second hole transporting layer comprising a member of the group consisting α -NPD, TPD, M14, MTDATA, HMTPD and R854 (column 15, line 23- column 16, line 3).

Re claim 24: Aziz discloses the first electron transporting layer comprising a member of the group consisting of an oxadiazole, an oxadiazole derivative, a phenanthroline, a substituted benzoxazole, an un-substituted benzoxazole, a substituted benzthiazole, and an un-substituted benzthiazole compound (column 17, line 35- column 18 line 25), where wherein the second electron transporting layer comprises a member of the group consisting of Alq3 and a phthalocyanine compound (column 17, line 26).

Re claim 25: Aziz discloses the first electron transporting layer comprising a member of the group consisting of OXD-7, BCP, a BCP derivative and TAZ, wherein the second electron transporting layer comprises CuPc (column 17, line 35- column 18, line 25).

Re claim 26: Aziz discloses the phosphorescent material comprising a member of the group consisting of Pt(ppy)(acac), Pt(tpy)(acac), Pt(bzq)(acac), Pt(btp)(acac), Pt(4,6-F2ppy)(acac), Pt(4,5-F2ppy)(acac), Pt(4,5-F2ppy)(pico), and Ir(4,6-F2ppy)(pico) (column 18, line 32-column 19, line 3).

Re claim 27: Aziz discloses the cathode comprising a member of the group consisting of magnesium silver and a magnesium silver alloy (column 21 lines 10-37), and the anode comprises ITO (column 14, line 51).

Re claim 28: Aziz discloses the substrate comprises a member of the group consisting of plastic, metal and glass (column 14, lines 43-44).

Re claim 29: Aziz discloses the substrate being substantially transparent (column 14, line 43).

Re claim 30: Aziz discloses the substrate is opaque, and the cathode is transparent (column 14, lines 54-63).

Re claim 31: The Examiner notes that the claim limitation of "the electronic device selected from the group consisting of... stadium screen" is drawn to the intended use of the claimed invention. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in

order to patentably distinguish the claimed invention from the prior art. It is well established that the claimed apparatus cannot be distinguished over the prior art by an intended use limitation. Consequently, absent of showing an unobvious difference between the claimed product and the prior art, the intended use claim limitation is not afforded patentable weight.

Re claim 32: Aziz discloses, in figure 3 and throughout the disclosure, an organic light emitting device comprising:

- a substrate (31);
- a cathode over the substrate (38);
- a first electron transporting layer over the cathode (36);
- a second electron transporting layer over the first electron transporting layer (35), wherein the second electron transporting layer is doped with a phosphorescent material;
- a first hole transporting layer over the second electron transporting layer (35), wherein the first hole transporting layer is doped with phosphorescent material;
- a second hole transporting layer over the first hole transporting layer (33);
and
- an anode over the second hole transporting layer (32).

Re claim 33: Aziz discloses the organic light emitting device that emits light in the blue region (column 13, line 59).

Re claim 34: Aziz discloses the first and second hole transporting layer comprising a member of the group consisting of α -NPD, TPD, M14, MTDATA, HMTPD and R854 (column 15, line 23- column 16, line 3).

Re claim 37: Aziz discloses the first electron transporting layer comprising a member of the group consisting of an oxadiazole, an oxadiazole derivative, a phenanthroline, a substituted benzoxazole, an un-substituted benzoxazole, a substituted benzthiazole, and an un-substituted benzthiazole compound (column 17, line 35- column 18 line 25), where wherein the second electron transporting layer comprises a member of the group consisting of Alq3 and a phthalocyanine compound (column 17, line 26).

Re claim 38: Aziz discloses the second electron transporting layer comprising a member of the group consisting of OXD-7, BCP, a BCP derivative and TAZ, wherein the first electron transporting layer comprises CuPc (column 17, line 35- column 18, line 25).

Re claim 39: Aziz discloses the phosphorescent material comprising a member of the group consisting of Pt(ppy)(acac), Pt(tpy)(acac), Pt(bzq)(acac), Pt(btp)(acac),

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Pt(4,6-F2ppy)(acac), Pt(4,5-F2ppy)(acac), Pt(4,5-F2ppy)(pico), and I(4,6-F2ppy)(pico) (column 18, line 32-column 19, line 3).

Re claim 40: Aziz discloses the cathode comprising a member of the group consisting of magnesium silver and a magnesium silver alloy (column 21 lines 10-37), and the anode comprises ITO (column 14, line 51).

Re claim 41: Aziz discloses the substrate comprises a member of the group consisting of plastic, metal and glass (column 14, lines 43-44).

Re claim 42: Aziz discloses the substrate being substantially transparent (column 14, line 43).

Re claim 43: Aziz discloses the substrate is opaque, and the anode is transparent (column 14, lines 54-63).

Re claim 44: The Examiner notes that the claim limitation of "the electronic device selected from the group consisting of... stadium screen" is drawn to the intended use of the claimed invention. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. It is well established that the claimed apparatus cannot be distinguished over the prior art by an intended use limitation. Consequently, absent of showing an unobvious difference

between the claimed product and the prior art, the intended use claim limitation is not afforded patentable weight.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12,13,22,23,35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aziz.

Re claim 12: Aziz shows all the limitations as shown above.

However, Aziz fails to teach or fairly suggest the first hole transporting layer having an IP energy not more than about 0.7 eV greater than the IP energy of the anode.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a first hole transporting layer having an IP energy not more than 0.7 eV greater than the IP energy of the anode for the purpose of optimizing the light emitted from the organic light emitting device. By limiting the deviance in IP energy from one layer to another, the number of holes emitted from the hole transport layer is significantly increased. The increase in the number of holes emitted from the hole transport layer increases the brightness of the devices while using less power.

Re claim 13: Aziz shows all the limitations as shown above.

However, Aziz fails to teach or fairly suggest the first hole transporting layer having an IP energy not more than about 0.5 eV greater than the IP energy of the anode.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a first hole transporting layer having an IP energy not more than 0.5 eV greater than the IP energy of the anode for the purpose of optimizing the light emitted from the organic light emitting device. By limiting the deviance in IP energy from one layer to another, the number of holes emitted from the hole transport layer is significantly increased. The increase in the number of holes emitted from the hole transport layer increases the brightness of the devices while using less power.

Re claim 22: Aziz shows all the limitations as shown above.

However, Aziz fails to teach or fairly suggest the first hole transporting layer having an IP energy not more than about 0.7 eV greater than the IP energy of the anode.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a first hole transporting layer having an IP energy not more than 0.7 eV greater than the IP energy of the anode for the purpose of optimizing the light emitted from the organic light emitting device. By limiting the deviance in IP energy from one layer to another, the number of holes emitted from the hole transport

layer is significantly increased. The increase in the number of holes emitted from the hole transport layer increases the brightness of the devices while using less power.

Re claim 23: Aziz shows all the limitations as shown above.

However, Aziz fails to teach or fairly suggest the first hole transporting layer having an IP energy not more than about 0.5 eV greater than the IP energy of the anode.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a first hole transporting layer having an IP energy not more than 0.5 eV greater than the IP energy of the anode for the purpose of optimizing the light emitted from the organic light emitting device. By limiting the deviance in IP energy from one layer to another, the number of holes emitted from the hole transport layer is significantly increased. The increase in the number of holes emitted from the hole transport layer increases the brightness of the devices while using less power.

Re claim 35: Aziz shows all the limitations as shown above.

However, Aziz fails to teach or fairly suggest the second hole transporting layer having an IP energy not more than about 0.7 eV greater than the IP energy of the anode.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a second hole transporting layer having an IP energy not more than 0.7 eV greater than the IP energy of the anode for the purpose of

optimizing the light emitted from the organic light emitting device. By limiting the deviance in IP energy from one layer to another, the number of holes emitted from the hole transport layer is significantly increased. The increase in the number of holes emitted from the hole transport layer increases the brightness of the devices while using less power.

Re claim 36: Aziz shows all the limitations as shown above.

However, Aziz fails to teach or fairly suggest the second hole transporting layer having an IP energy not more than about 0.5 eV greater than the IP energy of the anode.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a second hole transporting layer having an IP energy not more than 0.5 eV greater than the IP energy of the anode for the purpose of optimizing the light emitted from the organic light emitting device. By limiting the deviance in IP energy from one layer to another, the number of holes emitted from the hole transport layer is significantly increased. The increase in the number of holes emitted from the hole transport layer increases the brightness of the devices while using less power.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Gemmell whose telephone number is (703) 305-1937. The examiner can normally be reached on Monday-Thursday 6:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (703) 308-4858. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


emg


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PRIMARY EXAMINER